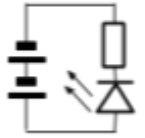


# Electric Charge

# Space School



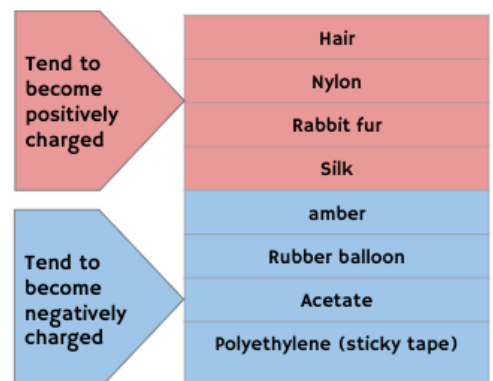
- 1) Read and fill in the missing words of the following text about electric charge

All matter is made up of a \_\_\_\_\_ Atoms consist of particles called protons, n \_\_\_\_\_ and electrons. Protons and neutrons make up the central part of the atom called the n \_\_\_\_\_ hile electrons surround the nucleus in shell-like orbits.

Atoms are held together because each of its particles have a property called electric c \_\_\_\_\_ Electric charge comes in two kinds: positive and n \_\_\_\_\_

- 2) State what kind of electric charge a proton carries.
- 3) Explain why protons repel other protons.
- 4) Explain why protons can exist in the tightly packed nucleus.
- 5) State which of the following statements are True or False:
- a) Protons and neutrons have the same charge
  - b) Protons and electrons have the same size of charge but opposite in sign.
  - c) Neutrons are neutral particles which means they carry no electric charge.
  - d) Protons have exactly the same mass as electrons.
- 6) State the quantity electric charge is measured in.
- 7) Explain why atoms are generally neutral.
- 8) If a neutral atom loses one of its outer shell electrons will it become positively charged or negatively charged. Explain your answer.
- 9) The triboelectric series shows what materials become positively charged and what become negatively charged.

- a) If nylon is rubbed does it lose or gain electrons?
- b) If amber is rubbed are electrons removed or added to it?
- c) Which two materials when rubbed together give the biggest charge?



10) Use the word bank for this question to fill in the missing words.

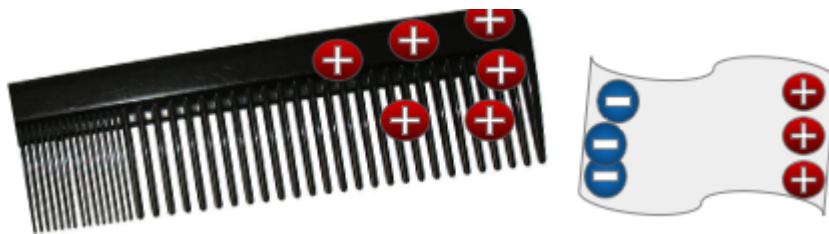
When a balloon is \_\_\_\_\_ against a woolly jumper some of the \_\_\_\_\_ from the outer shells of the atoms in the woolly jumper are \_\_\_\_\_ to the skin of the balloon.

The balloon now has a \_\_\_\_\_ of electrons and becomes \_\_\_\_\_ charged.

The woolly jumper now has \_\_\_\_\_ electrons and has a deficit of negative charge which makes it \_\_\_\_\_ charged.

Since the jumper is positively charged and the balloon is negatively charged then they will be \_\_\_\_\_ to each other.

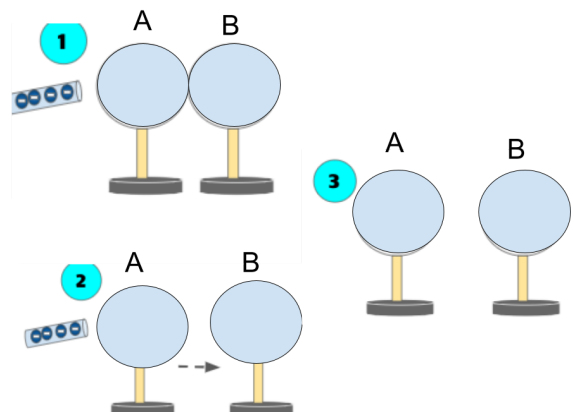
11) When a hair comb is rubbed it loses electrons and becomes positively charged, When it comes close to a small piece of paper it attracts the paper.



- When the comb is brought near the paper will the paper become positively, negatively charged or remain neutral?
- What is the name given to the process of electric charge being moved apart?
- Explain why the paper is attracted to the comb. *Mention why the positive charge on the paper does not repel the positive charge on the comb?*

12) Two metal spheres on insulating stands are in contact. A negatively charged rod is brought near to the spheres but does not touch.

The diagram shows three steps taken to charge both spheres with opposite charge.



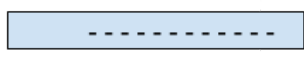
- For each of the steps 1 to 3 show the resulting charge on the spheres.
- State the name of this method of charging.

13) Four pupils discuss how an electroscope behaves when a negatively charged rod is brought close to its cap.  
Decide which pupil is correct.



**Alex:**  
The leaf rises because the negatively charged rod is a magnet and repels the south pole of the leaf.

**Jane:**  
When the negatively charged rod is brought near the cap, positive charges move from the cap to the stem and onto the leaf. Stem and leaf will then repel and the leaf will rise.



A negatively charged rod is brought near an uncharged electroscope cap.  
The leaf on the stem rises.



**Kai:**  
I don't think it's the positive charges that move. It is the electrons that are repelled onto the stem and leaf. Stem and leaf have like negative charges so they repel causing the leaf to rise.

**Ling:**  
The negative rod causes positive charges to leave the stem and leaf and move to the cap. Positive charges repel electrons and these gather on the leaf making it rise.



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Word Bank for question 1

1. charge
2. nucleus
3. atoms
4. negative
5. neutrons
- 6.

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Word Bank for question 10

1. rubbed
2. lost
3. transferred
4. negatively
5. surplus
6. positively
7. electrons
8. attracted